MM 87-268 /

IS/WP2-0166
18 DEC 91

ADVISORY COMMITTEE ON ADVANCED TELEVISIONS SERVICE
IMPLEMENTATION SUBCOMMITTEE
WORKING PARTY 2 - TRANSITION SCENARIOS
MINUTES OF THIRTY-THIRD MEETING 12/17/91

1. The meeting was called to order by Acting Chairman, Merrill Weiss, at 10:30 A.M. at PBS in Alexandria, VA.

2. A list of attendees is attached.

3. The agenda was approved with the following additions:

   5a) Develop list of documents to send proponents

   6a) Update on Local Area Group activity

   6b) Status of EIA Consumer Electronics Survey

4. The minutes of the 11/19/91 meeting were approved with the following changes:

   Correct spelling on Vradenburg.

   Page 3, item 11 - Change to read "Peter Bingham suggested ..... would be early adoption of an HDTV scanning standard prior to a final system choice .....".

5. Review of 11/19/91 action items:

   a) Carry as an action item to be addressed after Proponent meetings.

   b) Carry as an action item to be addressed after Proponent meetings.

   c) Contact with SS/WP4 and ATSC will be made within the next few days.

   d) No activity. Review under agenda item 8.

   e) No activity. Review under agenda item 8.

   f) No activity. Review under agenda item 7.

   g) Complete. Review under agenda item 7.

6. PERT Network Assumptions and Updates.

Merrill Weiss summarized the status on development of the PERT, Gantt and associated assumptions for each of the industry segments.

a) Consumer - PERT, Gantt and assumptions complete.

b) Cable
- PERT start date needs revision.
- Gantt charts require updating.
- Assumptions need update per discussions at 11/19/91 WP2 meeting.

c) Common Carrier
- PERT network needs to be put in CA Superproject format.
- Gantt chart needs development.
- Assumptions complete.

d) Satellite
- PERT network has not been reviewed during this year. Larry Cochran and Peter Bingham will attempt to get an industry representative to review. Merrill Weiss will put existing PERT network in CA Superproject format.
- Merrill Weiss will generate Gantt from PERT values.
- Merrill Weiss will extract assumptions from PERT for review by industry participant.

e) Broadcast
- 9 PERT charts nearly complete.
- 11 Gantt charts needed and partially complete.
- Assumptions still under development. An updated set of assumptions is attached (IS/WP2-0163). Merrill Weiss suggested that the "efforts" sections should be deleted for purpose of reviewing with Proponents and that equipment lists only be included for local station assumptions.

7. Plans for Proponent Meeting.

The order of presentation for the industry segments will be as follows:

1) Broadcast
2) Cable
3) Common Carrier
4) Satellite
5) Consumer Electronics

Merrill Weiss will make an overview presentation at the beginning of the meeting. Documents that need to be sent to Proponents are:

a) general instructions

b) PERT, Gantt & Assumptions

c) Question list

A partial list of questions to be asked of Proponents is as follows:

1) Are the SONET bit rates chosen for the assumptions correct?

2) Are the bit error rates delivered by SONET adequate for transport of the proposed systems?

3) Is it possible to carry the ATV signal and the NTSC signal on the same satellite? If so, at what bandwidth?

4) What signal form is anticipated for use in distribution to network affiliates and/or head ends? Has this been tested experimentally? How has production been done on the signal delivered? a) cut in, b) key in, c) full image manipulation.

5) Is extensibility built into the system? Under what prescribed conditions?

6) What is required in a consumer VCR for the system?

7) What provisions are made for conditional access without decoding the signal?

8) What are the transmission power levels required for the system?

Merrill Weiss will complete Proponent question list based upon these and other questions discussed at previous meetings.

The Proponent meeting will be held on January 13, 1992 at PBS. The agenda will be as follows:

Introduction	20 minutes
Broadcast Review	60 minutes
Cable Review	30 minutes
Common Carrier Review	15 minutes
Satellite Review	15 minutes
Consumer Electronics Review	15 minutes
Questions for Proponents	30 minutes
Questions from Proponents	30 minutes
Follow Up/Summary	30 minutes

Merrill Weiss will assemble the package of information for Proponents and attempt to mail by December 31, 1991.

8. Consumer Electronics Survey

Ken Skinner reported that, due to a miscommunication between WP2 and the EIA, the survey of consumer electronics manufacturers did not get mailed as anticipated. Instead, a teleconference was held to survey members of the SS/WP3 ATV Receiver Task Force,

which consists predominantly of consumer electronics companies. The information received was very limited and did not provide any useful new input on the PERT network. It was decided to redo the survey as an IS/WP2 document. Merrill Weiss will request a distribution list from the EIA and mail the survey by the end of the year with a requested response deadline of January 31, 1992.

9. Software Survey

Efforts to plan a software survey have not occurred because WP2 work has been focused on completing tasks for the Proponent meeting and outlining information for the Implementation Subcommittee Fifth Interim Report. Peter Bingham and Art Allison questioned the usefulness of such a survey. After a general discussion, it was decided that it would be useful to contact the networks concerning HDTV software availability/development. Due to WP2 resource limitations, further effort on this topic will be deferred until completion of the Proponent meetings. Charles Heuer noted that the lack of current network representation on WP2 to assist in tasks of this nature.

10. Local Area Groups

Merrill Weiss stated that he had re-established contact with three of the five Local Area Groups.

Chicago

Merrill reviewed the original written report from this Local Area Group. IS/WP2-0164.

San Francisco

Merrill reported that this group has been investigating the possibility of adding UHF antennas to extended outriggers on Sutro Tower. It had previously been reported that the addition of new antenna on Sutro was unlikely. The San Francisco group submitted sketches of this proposal along with a paper presented at the 1990 NAB entitled "The Antenna Transmission System and HDTV". IS/WP2-0165.

New York

Merrill Weiss reviewed a draft of this groups planned response to the recent FCC NPRM on ATV allocation issues.

Merrill will continue trying to obtain updates from the Boston and Los Angeles groups. All groups will be asked to meet again after power level estimates are obtained from Proponents.

11. Fifth Interim Report

Conference calls will be scheduled on the following dates to complete the draft of WP2 contributions to the Implementation Subcommittee 5th Interim Report.

Monday	12/23/91	3:00 P.M.
Monday	12/30/91	3:00 P.M.
Monday	1/6/92	3:00 P.M.

12. Summary of Action Items

    a) Identify PERT network resource requirements and determine total resources required to implement PERT network tasks - Merrill Weiss

    b) Determine impact on broadcast PERT implementation assuming typical staff limitations of small, medium and large stations - Merrill Weiss

    c) Contact SS/WP4, ATSC and FCC-OET concerning dissemination of system technical information - Merrill Weiss

    d) Complete Proponent document package and mail by 12/31/91 - Merrill Weiss

    e) Mail consumer electronics manufacturer survey - Merrill Weiss

    f) Complete Fifth Interim Report document - Merrill Weiss

13. The next meeting is scheduled as follows:

IS/WP2 Transition Scenarios
Monday, January 13, 1992
10:00 A.M. - 5:00 P.M.
Conference Room 6
PBS Building
1320 Bradock Road
Alexandria, VA

14. The meeting was adjourned at 5:30 P.M.

TRANSITION SCENARIOS

WP-2

December 17, 1991

NAME	COMPANY	ADDRESS	PHONE
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ART ALLISON	CONSULTANT	700 BRIGHTON KNOLLS DR. BRINKLOW MD	301 774 9536
William Zou	PBS	1320 Braddock Pl. Alexandria, VA 22314	703-739-5425
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Ken Skinner	Philips Laboratories	345 Scarborough Rd. Briarcliff Manor NY 10510	(914) 945-6375 (FAX) (914) 945-6088
PETER BINGHAM	"	"	" 914 945 6100
Merrill Weiss	Consultant	25 Mulberry Lane - Edison, NJ 08820-2908	(908) 906-0907
RAY LOWE	DSRC	201 WASHINGTON RD PRINCETON NJ 08543	609 734 2568

FCC ADVISORY COMMITTEE ON ADVANCED TELEVISION SERVICE
WORKING PARTY ON TRANSITION SCENARIOS
(WP2)

December 17, 1991
10:15 A.M. - 6:00 P.M.
PBS Building
1320 Bradock Place
Alexandria, VA

AGENDA

1. Adoption of Agenda.
2. Approval of 11/19/91 Minutes.
3. Review of Action Items from 11/19/91 Meeting.
4. Review PERT Network Assumptions and Updates.
5. Finalize Plans for Proponent Meeting.
6. FCC Interpretation of CBS Report.
7. Review 5th Interim Report Draft.
8. Review Development of Software Survey.
9. New Business.
10. Conclusions and Action Items.
11. Next Meeting.

IS/WP2-0163
17 DEC 91

IS/WP-2 PERT Chart

Supporting List of Assumptions

Local Station: Full HDTV Replacement - Scenario 3

General Assumptions

1. Test & Measuring Equipment includes monitoring equipment
2. Distribution Amps design insensitive to raster format (only bandwidth is important)
3. Up-Converter required to air NTSC programming on HDTV channel
4. Titling Generator required for Station ID's as a minimum
5. Small Router implies few in, 1 out, plus patching/cabling
   Design insensitive to raster format
6. Early tasks burdened by learning process for new technology
7. Space is available for installation of new/additional equipment
   (No walls, HVAC, lighting, consoles, racks, power required)
8. Station takes network in real time (no Delayed Broadcast) for Phases I & II
9. System installed uses serial digital interconnect for either
   analog or digital transmission
10. Design effort includes full documentation

Specific Assumptions

Task 15 - Construct Bypass Facility

A. Assumptions
1. Manual control used for 3 sources only
2. Install in existing MCR while on air

B. Equipment
Satellite receiver
Minimum 3 X 1 switcher
Up-Converter
Character generator
Monitoring/test

C. Effort
1 Designer
3-4 wks @ ½ days - preliminary planning
3-4 wks - design
30-60 days - order equipment & receive
30 days - supervise installation (or other individual)
2 Technicians
30 days - install

Task 17 - Convert/Install Commercial Playback Facility

A. Assumptions
1. NTSC original commercials upconverted in real time
2. HDTV commercials play from tape

B. Equipment
2 - VTRs
Monitoring
Sync/pulse
Edit controller

C. Effort
1 Designer
3 wks @ ½ days - preliminary planning
1 wk - design
30-60 days - order equipment & receive
2 wks - supervise installation (or other individual)
2 Technicians
2 wks - install

Task 18 - Convert/Install Release Facility

A. Assumptions
1. Interface to existing MCR control scheme
2. Install in existing MCR while on the air

B. Equipment
Release switcher
Character generator upgrade
Still store?
Frame synchronizer

C. Effort
1 Designer
3 wks @ ½ days - preliminary planning
2 wks - design
30-60 days - order equipment & receive
30 days - supervise installation (or other individual)
2-3 Technicians
30 days - install

Task 20 - VTR Record/Playback Addition

A. Assumptions
1. Need to record from satellite or play tapes
2. Back-to-back playback possible if no DB
3. 4 machines minimum needed for DB

B. Equipment
2 - VTRs
Monitoring

C. Effort
1 Designer
2 wks - design
30-60 days - order equipment & receive
1 wk - supervise installation (or other individual)
2 Technicians
1 wk - install

Tasks 22 & 23 - Studio Conversion and Switcher & Special Effects - Phase I

A. Assumptions
1. Studio operations must continue during conversion
2. Alternate control room can be provided or HDTV control room is built in parallel
3. Studio physical condition adequate for HDTV (especially floor, lighting)
4. Production issues addressed separately and not limiting to conversion (sets, shot blocking, lighting, etc.)
5. Audio requires no change

B. Studio Conversion Equipment (Task 22)
Cameras
Camera cable
Prompters

C. Switcher & Special Effects Equipment (Task 23)
Switcher w/effects
Monitors (Pix & WFM)
Digital Effects
Camera CCU's
Monitor wall
Consoles (including support fax) (switcher, camera control, etc.)

D. Effort
1 Designer
1 month @ 3-5 days/week - preliminary planning
3 months - design
60-120 days - order equipment & receive
90 days - supervise installation
3-4 Technicians
90 days - install

Task 24 - Graphics Conversion - Phase I

A. Assumptions
1. Space available in existing graphics facility
2. Users provide information on equipment available

B. Equipment
Character generator
Paint system
Still store
Small switcher
Monitors

C. Effort
1 Designer
2 wks @ ½ days - preliminary planning
2 wks - design
30-90 days - order equipment & receive
3 wks - supervise installation
2 Technicians
3 wks - install

Task 25 - Local Distribution - Phase I

A. Assumptions
1. Includes ground work for eventual full plant distribution

B. Equipment
Routing switcher (20X20)
Video distribtuion amplifiers
Jacks & cables
Monitoring
Machine control

C. Effort
1 Designer
2-3 wks @ ½ days - preliminary planning
4 wks - design
30-90 days - order equipment & receive
4 wks - supervise installation
3 Technicians
4 wks - install

Task 26 - Small Edit Facility - Phase I

A. Assumptions
1. Existing edit facility converted
2. Conversion to-from NTSC required for continuity
3. 2nd upconverter needed since 1st devoted to air use

B. Equipment
Downconverter
Upconverter
3 - VTRs
Editor
Switcher/Effects
Routing
Monitoring
Control

C. Effort
1 Designer
2 wks @ ½ days - preliminary planning
4 wks - design
30-90 days - order equipment & receive
4 wks - supervise installation
2-3 Technicians
4 wks - install

Task 28 - Graphics Conversion - Complete

A. Assumptions
1. Space available in existing graphics facility
2. Users provide information on equipment available
3. Includes clearing out existing NTSC equipment

B. Equipment
Character generator - additional channels
Paint system - additional channels/work stations
Still store - additional channels
Switcher - additional or upgrade
Monitors

C. Effort

1 Designer

2 wks - preliminary planning

3 wks - design

30-90 days - order equipment & receive

4 wks - supervise installation

2 Technicians

4 wks - install

Task 30 - Digital Special Effects

A. Assumptions

1. Installed in studio control room at same time as renovation
2. Rack space available where NTSC gear displaced

B. Equipment

Digital effects system - multiple channels

Monitors

C. Effort

1 Designer

2 wks - preliminary planning

2 wks - design

60-120 days - order equipment & receive

2 wks - supervise installation

2 Technicians

2 wks - install

Tasks 33 & 34 - Switcher & Special Effects and Studio Conversion - Completion

A. Assumptions
1. Studio operations must continue during conversion
2. Alternate control room can be provided or HDTV control room is built in parallel
3. Studio physical condition adequate for HDTV (especially floor, lighting)
4. Production issues addressed separately and not limiting to conversion (sets, shot blocking, lighting, etc.)
5. Audio requires no change

B. Studio Conversion Equipment (Task 34)
Cameras
Camera cable
Prompters

C. Switcher & Special Effects Equipment (Task 33)
Switcher w/effects
Monitors (Pix & WFM)
Digital Effects
Camera CCU's
Monitor wall
Consoles (including support fax) (switcher, camera control, etc.)

D. Effort
1 Designer
1 month @ 3-5 days/week - preliminary planning
3 months - design
60-120 days - order equipment & receive
90 days - supervise installation
3-4 Technicians
90 days - install

Task 37 - VTR Conversion - Complete

A. Assumptions
1. All functions other than ENG to be replaced
2. Space available where existing machines are displaced

B. Equipment
XX - VTRs [XX to be replaced with average number]
Monitoring

C. Effort
1 Designer (or 2?)

Task 29 - Large Edit Facility

A. Assumptions

B. Equipment

C. Effort
1 Designer

Task 31 - Small Edit Facility - Complete

A. Assumptions

B. Equipment

C. Effort
1 Designer

Task 32 - Internal Distribution - Complete

A. Assumptions

B. Equipment

C. Effort
1 Designer

Task 35 - Network Receiver Conversion - Complete

A. Assumptions

B. Equipment

C. Effort
1 Designer

Task 36 - Routing System - Complete

A. Assumptions

B. Equipment

C. Effort
1 Designer

Task 38 - Release Facility - Complete

A. Assumptions

B. Equipment

C. Effort
1 Designer

IS/WP-2 PERT Chart

Supporting List of Assumptions

Transmitter: Simulcast w/Existing Tower - Scenario 2 - Alternative A

General Assumptions

1. Station Assignment process occurs following FCC Final Report & Order
2. The average station will experience litigation delays of a year
3. Governmental approval times are typical of those experienced previously
4. Station has existing tower with space & wind loading for additional antenna
5. Some strengthening of tower is required to accommodate additional load
6. Transmitter building does not have room for additional transmitter
7. Local approvals are required for transmitter building expansion
8. Local approvals are required for addition of antenna to tower
9. Spectrum is ultimately found for station-owned STL
10. Space exists for additional STL antennas at both ends of link

Specific Assumptions

Milestone 1 - Advisory Committee Final Report

A. Assumptions
1. Advisory Committee completes final report on current schedule
2. Advisory Committee report recommends system choice
3. No litigation that impedes process

Task 2 - NPRM Generation & Channel Allotment

A. Assumptions
1. FCC issues NPRM on announced schedule
2. Channels are allotted to cities at release of NPRM
3. FCC accepts Advisory Committee recommendation on system choice
4. No litigation that impedes process

Task 3 - Comment & Decision Period

A. Assumptions
1. Allows time for comments & reply comments
2. Provides time for preparation of Final Report & Order
3. No litigation that impedes process

Milestone 4 - FCC Report & Order

A. Assumptions
1. Final Report & Order confirms choice of single system

Task 5 - Station Assignment Process

A. Assumptions
1. Station channel assignment conducted after Final Report & Order
2. Stations cannot begin designs until after channel assignment
3. No litigation that impedes process

Task 6 - Litigation

A. Assumptions
1. Stations will experience some delay from litigation
2. All litigation, wherever in process, aggregated at this point
3. Litigation is not extended, is resolved on expedited basis
4. Litigation affects certainty of channel assignment for stations

Task 7 - Antenna/Tower Design

A. Assumptions
1. Station will not begin final design until channel is certain
2. Preliminary work done well in advance
3. Tower reinforcement, antenna mounting, & transmission line included
4. Side-mounting of antennas for selected system is possible
5. Design is for single station on its own tower
6. Modelling of antenna interactions is not necessary

Task 8 - FCC Construction Permit Issuance

A. Assumptions
1. CP grant dependent only on technical design
2. CP grant not dependent on local approvals
3. CP grant in semi-realistic time after application

Task 9 - Tower Alteration

A. Assumptions
1. Tower reinforcement required to support additional antenna/xmsn line
2. Required relocation of other antennas is minimal
3. Antenna can be mounted without major tower rebuild

Task 10 - Antenna Fabrication & Delivery

A. Assumptions
1. Antenna fab will not begin before CP grant
2. Contingent order placed well in advance to hold place for delivery
3. Antenna manufacturing capacity sufficient to meet demand

Task 11 - Antenna & Transmission Line Installation

A. Assumptions
1. Weather not a factor in installation completion within slack time

Task 12 - Local Zoning Permits

A. Assumptions
1. Zoning Permit required for extension of transmitter building
2. Zoning Permit granted in typical time

Task 13 - Local Planning Approval

A. Assumptions
1. Plan approvals required for transmitter building extension
2. Plan approvals required for tower reinforcement & antenna addition
3. Plan approvals granted in typical time

Task 14 - Building Construction or Alteration

A. Assumptions
1. Building construction/alteration not "fast-tracked"
2. Building construction/alteration in typical time

Milestone 15 - Auxiliary Link Spectrum Allocation

A. Assumptions
1. Separate STLs are required for Simulcast & NTSC channels
2. FCC allocates sufficient spectrum for Auxiliaries at time of Final R&O
3. Spectrum may be same as currently u for STLs, etc.
4. Spectrum sharing w/existing analog FM STLs is technically possible
5. Simulcast & NTSC Auxiliaries may share existing paths/channels

Task 16 - STL Frequency Search

A. Assumptions
1. Frequency search ultimately successful

Task 17 - STL CP & License

A. Assumptions
1. STL CP & license granted in "nominal" time

Task 18 - STL Antenna & Transmission Line Installation

A. Assumptions
1. STL antenna/xmsn line installation delayed for good weather
2. Weather not a factor in installation completion within slack time
3. Adequate mounting space available without significant construction

Task 19 - STL Transmitter & Receiver Installation

A. Assumptions
1. STL transmitter/receiver installation in parallel with antenna/xmsn line
2. Adequate equipment space available in existing facility

Task 20 - Negotiate Telco STL

A. Assumptions
1. Local common carrier can interconnect Studio & Transmitter
2. Circuits available with good reliability & technical characteristics
3. Negotiations in parallel w/microwave frequency search, as backup
4. Microwave frequency search or channel sharing w/NTSC successful

Task 21 - STL Performance Analysis

A. Assumptions
1. STL passes proof-of-performance test on first try
2. Path reliability is good

Milestone 22 - STL Initial Use On Air

A. Assumptions
1. STL put in use for NTSC operations as test
2. If combined STL, helps transition to new system

Task 23 - Encoder Available

A. Assumptions
1. Technical info to start encoder design available at time of NPRM
2. Full technical documentation available at Final Report & Order
3. No commitment to special ICs until Final Report & Order
4. Encoders available in sufficient quantity to meet any demand

Task 24 - Exciter/Transmitter Available

A. Assumptions
1. Technical info to start exciter design available at time of NPRM
2. Full technical documentation available at Final Report & Order
3. No commitment to special ICs until Final Report & Order
4. Exciters & transmitters available in sufficient quantity

Task 25 - Transmitter Installation

A. Assumptions
1. Transmitters available as needed without difficulty
2. Support facilities must be constructed in transmitter bldg extension

Task 26 - Overall System Performance Analysis

A. Assumptions
1. Overall Simulcast system passes proof-of-performance on first try

2. Dummy load & antenna tests

Milestone 27 - Initial Test Signals On Air

A. Assumptions
1. Station goes on air with test signals until Program Test Auth. received
2. Test signals used for field test of new system

Task 28 - FCC Program Test Authority

A. Assumptions
1. FCC grants immediate, automatic Program Test Authorization by FAX

Task 29 - FCC License Grant

A. Assumptions
1. FCC grants final license with moderately short turnaround

Milestone 30 - Initial Programming On Air

A. Assumptions
1. Program Test permits airing programming until license received

IS/WP-2 PERT Chart

Supporting List of Assumptions

Transmitter: Simulcast w/Existing Tower - Scenario 2 - Alternative B

General Assumptions

1. Station Assignment process occurs concurrent with FCC Final Report & Order
2. Station will experience no litigation delays
3. Governmental approval times are "nominal," i.e. very short
4. Station has existing tower with space & wind loading for additional antenna
5. Some strengthening of tower is required to accommodate additional load
6. Transmitter building does not have room for additional transmitter
7. Local approvals are required for transmitter building expansion
8. Local approvals are required for addition of antenna to tower
9. Spectrum is ultimately found for station-owned STL
10. Space exists for additional STL antennas at both ends of link

Specific Assumptions

Milestone 1 - Advisory Committee Final Report

A. Assumptions
1. Advisory Committee completes final report on current schedule
2. Advisory Committee report recommends system choice
3. No litigation that impedes process

Task 2 - NPRM Generation & Channel Allotment

A. Assumptions
1. FCC issues NPRM on announced schedule
2. Channels are allotted to cities at release of NPRM
3. FCC accepts Advisory Committee recommendation on system choice
4. No litigation that impedes process

Task 3 - Comment & Decision Period

A. Assumptions
1. Allows time for comments & reply comments
2. Provides time for preparation of Final Report & Order
3. No litigation that impedes process

Milestone 4 - FCC Report & Order

A. Assumptions
1. Final Report & Order confirms choice of single system

Task 5 - Station Assignment Process

A. Assumptions
1. Station channel assignment made concurrently w/Final Report & Order
2. Stations cannot begin designs until after channel assignment
3. No litigation that impedes process

Task 6 - Litigation

A. Assumptions
1. No delay from litigation once Final Report & Order issued
2. No uncertainty of channel assignment for stations

Task 7 - Antenna/Tower Design